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**The Fundamentals  
of Perspective Text Analysis**

**Bernhard Bierschenk**

1993  
2013

No. 45

*Substantially Revised and Extended Edition*



Copenhagen University  
Denmark



Lund University  
Sweden

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### **Abstract**

The major assumption made is that language as a natural system is both self-organising and self-referential. Compared to common syntactic-semantic approaches, the present approach is ecological and builds on the unambiguous identification of textual agents and agencies together with their objectives. Because information transaction cannot be studied without an emphasis on the text producer's text building behaviour, his intended and oriented schematising as unitizing activity has been focused upon. The main principles making up the foundation of Perspective Text Analysis are presented in the form of 15 propositional statements. These are discussed with a stress on the involved dynamic formalism that creates co-operation and interaction between various (AaO) unities. This implies a stress on analysis and synthesis of the morphogenesis of conceptualizing processes. It follows that PTA traces the transformations involved in the aggregation of joint textual elements into systems. These may be characterized by particular geometric profiles specifying the boundary conditions of the language space in which the textual flow patterns occur, containing the perspective and objective invariants of a particular configuration.

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## 1 A New Foundation for Text Analysis

Human behaviour is dependent on a source, potential, or cause which has been characterized by terms such as *energy*, *spirit*, *élan vital*, *life*, *intentionality*, *intention to stay alive*, *survival*, *genetic code*, *natural systems*, and *synthesis*. Probably the oldest of these terms is *energy* meaning vigour or power in action. This meaning is derived from the Greek words ‘en+ergon’ which specifies the circumstance that someone or something is at work. All other terms are to be conceived of as variations in discipline or orientation. Common to all is the observation that all things become structured by it. In physics, hypotheses about various forms of energy have crystallised into a *Periodical System of Energies*, which was proposed by Feekes (1976). Theoretically, the classical models of energy give expression to the view that analytical propositional (p(X))-knowledge is the result of an investment of physical and/or psychic energy generated by the individual regardless of *the ecological information flow*, (Gibson, 1979) i.e., something reflecting the forms of dynamic processes in the organism-environment system. Judging from the conventionally given descriptions, based on the power models of Feekes (1976, p. 155), objects cannot be known with certainty because they are indeterminable and therefore, cannot be perceived directly. The basis for generating correct and generalizable pieces (p(X)) is the idealised or abstracted individual. In generating differential fragments of knowledge, analysis is favoured over synthesis, because the intensity or power law involved produces the desired normative (p(X)) structure based on the intentional-extensional logic. In general, intensity is the generic term, which is conjugated with an extensive quantity. It is usually assumed that a production rate is mediated in terms of the number of (p(X)) and rate production per time unit.

### 1.1 PTA-System Expression

In contrast, knowing emerges from the co-operation and interaction of multiple agents. It is dependent on the conditions of perspectivation and the cognitive functions of natural language. Thereby it is assumed, that the Agent-action-Objective (AaO) schema is the axiomatic basis for the steering and control mechanism involved in the development of both behavioural and cognitive abilities.

**Proposition 1** *Knowing rests entirely on the synthetic (AaO) proposition by which an individual expression is schematised.*

**Transactions of the Synthetic (AaO) proposition:**

System Expression:  $[AaO]_n = [A_n \text{ a } O_n]_n$ , where

A-linkage  $A_n = \text{Text} / X / A_{n-1} / [A_{n-1} \text{ a } O_{n-1}]$

O-linkage  $O_n = \text{Text} / Y / [A_{n+1} \text{ a } O_{n+1}]$

Multiple linkage  $\{ [AaO]_n \text{ a } [AaO]_{n+1} \}_{n+2}$

X: Variable representing unknown textual agent

Y: Variable representing unknown textual objective

In the study of knowing, the foundation of the algorithmic working PTA mechanism was formulated against the background of Kant’s principles, which he presented during the 18<sup>th</sup> century. In his formulation, he concentrated on the logical form of judgement and pure reason

by which the unknown could be made known. Immanuel Kant (1975) argued that knowing is brought about by the schema axiom whose theorems guide and control the process of synthesizing. They constitute the basis for the proposed *linkage mechanism* (B. Bierschenk, 1981, 1991) that controls through natural language expressions the subtle movements of thought.

**Proposition 2** *The significance of the linkage mechanism in an intra-systemic analysis appears only in the Kantian schema as synthesis.*

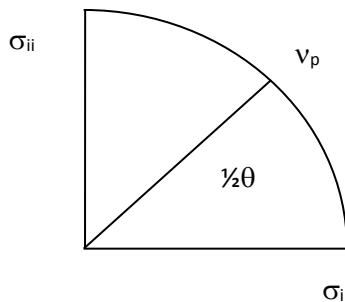
To summarise, the Kantian approach makes fully use of a morphological perspective on information flows. Although the *laws of information*, as stipulated by Gibson (1979), may be novel, they, nevertheless, can be approached through accepted geometric procedures emphasising (1) distance, (2) singularity, and (3) invariants (Kugler & Turvey, 1987, p. 10).

Presently, the concern is about an advanced description of some of the basic operations of the PTA System. For that purpose, the spinor mathematics of Hestenes (1986/1993) has been used, because it is providing a novel frame of reference. Compared to the digital calculations of the previous approach, this theory is emphasizing rotations and thus appears more efficient. To get the rotations under methodological control, it has become necessary to find a design solution to the question of what kind of information the observer perceives and to what extent perceived information can be abstracted and extracted through invariants. Detecting these invariants implies the detection of morphological string properties. The ability to give expression to strings rests on the (AaO) formula expressing itself in the extraction of morphological properties. Primarily through cyclic and recurrent activities, the schema should be observable in interaction and development of limits.

## 1.2 String Rotation and Grapheme Production

The essential property of the *string-hypothesis* of Edward Witten (Greene, 1999, p. 298) is replacing the hypothesis of a zero-dimensional point, as proposed by classical physics, with the one-dimensional string. Accordingly, the string, as presented by Brian Greene (1999), is founded on the premise:

*... that a particle is not pointlike, but instead consists of a tiny one-dimensional loop. Like an infinitely thin rubber band, each particle contains a vibrating, oscillating, dancing filament /.../ named a string. (p. 14)*



The production of a string appears in the presence of a small kinetic potential ( $v_p$ ). Since the  $v$ -function of a string represents the energy needed to produce a *signal of intent*, it is controlled by a stepping function ( $i$ ), which governs the materialisation of a kinetic potential in the form of a signal ( $\sigma_i$ ).

**Figure 1** *Angle and area of a circular sector*

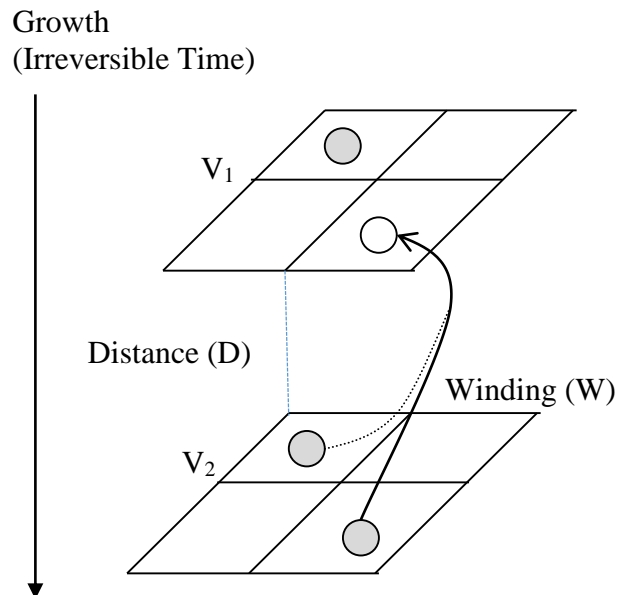
As shown in Figure 1, the component of the compound ( $v_p \wedge \sigma_i$ ) is assumed to be *proportional to the radius of the circular dimension of an unwrapped string* (Greene, 1999, p. 238; Hestenes, 1986/1993, p. 67). Since a component of an unwrapped string is supposed to have some minimum length, operating with the string-concept translates into the problem of formalising some of the basic operations that can be performed with reference to the length of certain strings ( $\sigma_i$ ). This kind of operations is expected to be sufficient for a functional expression of the magnitude of a string and to regard the exponential function ( $e^{i\theta}$ ) as the magnitude of a string-grapheme composite.

According to (Wales, 2003, p. 2), the potential energy ( $v_p$ ) for  $N$  strings in three dimensions, namely the dimensions of (1) intention, (2) orientation and (3) directiveness, may be conceptualised as the components of a  $3N$ -dimensional vector ( $\mathbf{X}$ ). Hence,  $v(\mathbf{X})$  is a  $3N$ -dimensional object, embedded in a  $(3N+1)$  dimensional space. The extra dimension corresponds to the value (= magnitude) of the potential energy function.

In an attempt to make the expression of *winding strings* operational (B. Bierschenk, 2001), string theory assumes that kinetic energy is stored in *wound string-grapheme composites*. Hence, when strings are resonating ( $\Delta\sigma$ ), they are producing a spectrum for the expression [ $\gamma = (v \wedge \sigma)$ ], which leads to the bi-directional grapheme-vector ( $|\gamma|$ ). For this reason, the outer product ( $\wedge$ ) provides a unique relationship, which constitutes the foundation for Hestenes' *attitude spinor* (Hestenes, 1994, p. 72). Consequently, a distinction can be made between directiveness and orientation as a function of states. To repeat, Hestenes (1986/1993, pp. 66-68) asserts that the angle ( $|\theta|$ ) represents the magnitude of a spinor. These limitations define expressed imagination as product of schematising processes and thus, as point of departure for information synthesis.

### 1.3 Coupling and Entangling of States

By localising the strings on opposite dots as shown in the plots of Figure 2, resonance properties of floating strings, can be captured, observed and measured. In separating the dots in the first plot through the  $V_1$ -function, two types of dots can be identified:



**Figure 2** Coupling and entangling of states

A filled dot, which relates to a string of graphemes, and a non-filled dot, which represents a virtual string. Furthermore, in using the gating function of Functional Clause (FC) as key building block (I. Bierschenk, 1992, p. 11), it is demonstrable that a non-filled dot has the function of a placeholder. Furthermore, placeholders perform the task of channelling the strings on a filled dot coherently into vertically aligned *compounds*.

As shown in Figure 2, a compound leads to tunnelling. The notion *tunnel* allows the definition of neighbourhood and distance. Both are of particular import in the crossing of borders and the establishment of a language space. Therefore, the production of composites is explainable as a path in this space, which is transited with various rotational speeds. Moreover, tunnelling through the formation of entangled states necessitate observations on the gradient dynamics of strings of graphemes and the development of the evolutionary properties of composites.

As a minimum, structure is only partly visible through an AaO unit and often just by chance through organisational keys. Since the keys are stable, it is possible to approach displacements phase-independent. Distance (D) is the expression for displacements in equal steps. With respect to the individual components of the AaO unit, equal-step operations do allow neither rhythmic nor clock-like rotations. On the other hand, when movement patterns become phase-dependent an opening of the AaO spheres is required and implies that every single sub-unit is following its own autonomous rhythm.

By handling this individuality, the AaO system is capable of establishing two autonomous clocking modes, namely the *A-clocking*, governing the A-subunit and the *O-clocking*, governing the O-subunit. The fact that displacements lead to the generation of layered composites has been used in the operational definition of the notions *speed* and *acceleration*. In a straightforward application of these terms, it is possible to derive the dynamical properties of a compound as well as of a composite from the recombination spectrum. Moreover, locally constraint movements of patterns of strings can be evaluated based on local fluctuations, which appear as global.

Due to Gibson (1979) it can be stated that interaction at the ecological level is *informational* and *not forceful* (Kugler & Turvey, 1978, p. 64). A person interacting with his fellows need to know what it is that is of significance to others. But this knowledge is dependent on the conditions of perspectivation. To know something about reality requires the introduction of some diagnosing materials or the design of an experiment that contains the *knowable* (B. Bierschenk, 1984). Knowability is the foundation of inquiry into people's possibility to exert perspective control over their existence and to acquire a comprehensive overview.

Because people's perspective is in the *verbal/textual flow*, it is only a thermo-dynamic flow analysis and its description that can be taken as hallmark of systemic inquiry into people's *text building behaviour*. By this is meant that a person can give verbal/textual expression to perceived ecological conditions. The expressions may either relate to the ongoing process of making experience or to the expression of already made experiences. With this reasoning in mind, the following proposition can be stated:

**Proposition 3** *Con+sciousness (together+knowing) is a function of shapeless and formless conceptual affordances plus a patterned context, embedding transcendent and constraining invariants.*

Theoretically, this proposition gives expression to the view that consciousness is the result of a co-variation and interaction of kinematic terms at the macro level. It is assumed that a macroscopic description is law based. As Kugler & Turvey (1987, p. 424) observed: ... *whenever geometries are coupled to conservation, laws arise*. Previous research (B. Bierschenk, 1991) makes clear that the experimental subject develops a unique ability of



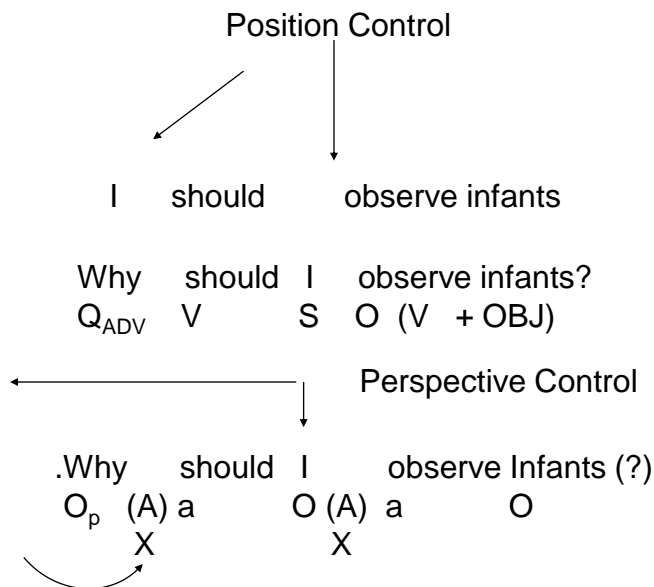
using this kind of higher-order functions effectively and that this ability achieves its highest form in the expression of natural text building behaviour.

## 2 Text Building

The cognitive integration of experience is an inherent property of text building. The ability to give expression to integrated experiences co-varies with the text building behaviour of the agent. This implies that the nature of a text consists of appropriately selected ecological objectives put into words.

**Proposition 4** *The agent's text building behaviour is constraint by perspective and contextual invariants contained in textual flows.*

This proposition builds on the assumption that text materials, used for description, is arranged systematically in order to carry ecological as well as perspective invariants. Functionally, the conjugation of both parts may be seen as the constituents of textual flow morphologies. Since this spectrum is a function of textual movement patterns, i.e., Gestalts, position versus perspective control can be processed only if the produced text consists of a number of qualitative distinct phases. The generation of phases comes to an end with the emergence of a full stop marking end of sentence or end of text. The contrasting operations are based on the following general system expression:



**Figure 3** *Position versus perspective control*

Position versus perspective control is stressing the important fact that perceiving, acting and knowing have to be conceived within the context of joint operations and within an ecologically determined system rather than as the activity of disjoint and thus isolated agents. As a result, what is knowable of the world one lives in should be studied based on a co-operative act, which defines consciousness because of the affinity of active inquiring agents. In this sense, it has been found that language provides not only the logical but also the most fundamental basis (I. Bierschenk, 1992a, b).

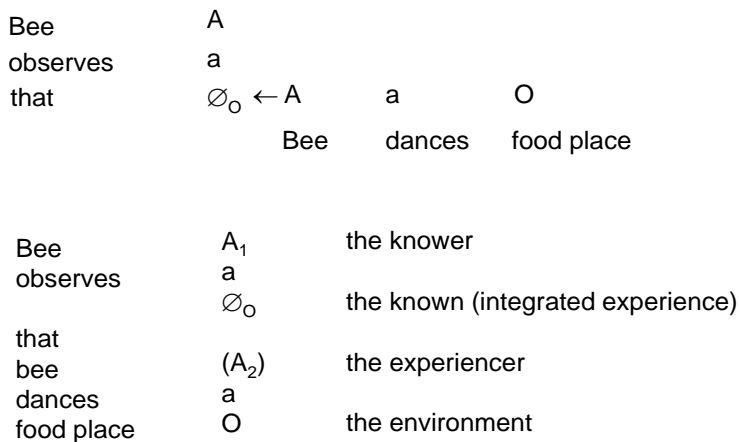
Apparently, the text building has to be viewed as a transformational writing-reading-rewriting process. Internal energy generating forces drive this process towards the layout of strings of graphemes and patterns of strings. At the surface level, these patterns may be regarded as texture-like checker-squares with clearly marked borders. Patterned strings are purposely arranged this way as medium for carrying the informational invariants.

As a first measure, the patterns have to be delimited and described (I. Bierschenk, 1992a). By identifying their geometrical (spatial) properties and kinematic (space/time) arrangement, they can be fashioned in arrays. In the course of text production, continuous successions of demarcations of borders are characterising the language system as self-organising and thus as unbound. The result is that the PTA system is closed with respect to the working of its subsystems but open with respect to its textual flows. These become structured by *clause* and *sentence* markers, which are identifiable, based on a very small dictionary containing the graphemes, strings and patterns of strings to be matched with running text.

## 2.1 The Agent as Scale Factor

What is central to consciousness is indicated by Immanuel Kant's observation in *Anthropology* namely that a human being can have the idea of an ('I') which can transform the human being into an *autonomous* and a *responsible* agent. From the Kantian point of view, this means the study of *intentional behaviour*. Intentional behaviour is *teleonomic* (Monod, 1971) in nature and aimed at: (1) transforming the environment, (2) preserving experience, and (3) increasing the individual's competence for structuring his environment. Ecological perception emphasises information transaction through co-operation between a knower and a knowable environment.

The goal is an *affinity* analysis that ensures both the formal or representational and the empirical or referential functions of the mind, usually referred to as comparison between a model-typical and a pheno-typical approach. By contrasting both (B. Bierschenk, 1990), quality or depth can be stated formally. This approach excludes the occurrence of anything that is unknown. The unknown can easily be interpreted as the ambiguous, the unrepresented, or unnamed (Brodsky, 1987). The basic assumption is that text only can be analysed with reference to something being its source. In Figure 4, there is no statement on anything but a description of processes, objects and events.



**Figure 4** Agent-governed integration of information

What kind of information can be picked up from the objectives depends on the perspective chosen. It cannot be inferred from general statements or from surface features, because it is parasitic on the sequences of events that bind the '*perceiver*' with the '*perceived*' or the '*knower*' to the '*knowable*'. Ultimately, only sequences of events involving the objectives can carry the structures to be reflected through language.

**Proposition 5** *In text building the agent determines what kind of objectives is chosen and how they change throughout the process of texture production.*

This proposition implies that the agent as observer of itself is the texture producer. This means that there must be something, which is producing a texture intentionally and a synthesizing mechanism that transports *linguistic form* (Frisch, 1967) and organisation into structural information.

In Kantian terms, the construction of representational environments means a narration of the problems of co-ordination, co-operation and competition at all levels of organisation. Its function is to relate *survival* to possible consequences. To speak with Kant, these forms are *concrete*, because they are synthetic and thus complete and particular. From a methodological point of view, the *incompleteness* problem (Raff, 1996, p. 107) forms the representational problem of scientific reasoning about consequences. Once this problem is recognised, the foundation is laid for a discourse on the nature of *reality* and that of *order* (Bohm, 1980/1990). Nevertheless, the terms of a system cannot be synthesized without an active inquiring agent. Therefore, the procedure for generating a system for an ecological language description must be *agent-governed*.

## 2.2 *The Operative Space*

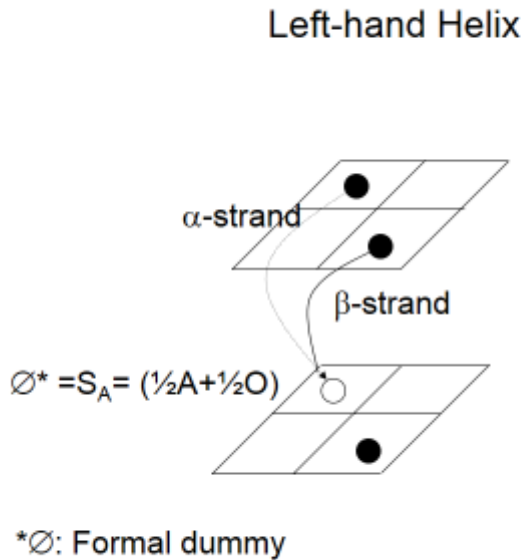
Only under the condition of a language that can create an *operative space* within which the empirical agent can narrate alternative acts and consequences (Jaynes, 1976/1982, pp. 59-64), the basis for co-operation between material and immaterial constraints can be studied in a meaningful way. This space is functional not geometrical, because everything is localised according to ecological principles. In this space, intention and orientation are producing irreversible processes that are real and play a fundamental role in development and progressive organisation of the language space. Text building is deeply entrenched in movements (I. Bierschenk, 1992 b) and is arising out of kinematic interactions in which every verbal/textual event is proceeding at a particular moment in a certain region of the operative space. This makes it possible for the production process to be co-ordinated as a whole. However, unfolding the configurational architecture of a natural language requires a procedure that has the capacity of processing its implicit syntactic relations.

### 2.2.1 *Intention*

The process of introducing an analogue (I) (Jaynes, (1976/1982) transfers textual agents from one segment to another. This implies a displacement process and thus the expenditure of energy. Co-operatively and interactively working *textual agents* comprise a functional coupling, which manifests itself by a *helix*. Various agents and agencies mark the helix carrying the intentions of the text producer. Unfolding this helix show at which points in time new agents are introduced and how they shift throughout text production. The agents embedded in the system expression give rise to a cyclic development of natural expressions into a hierarchic order.

**Proposition 6** *Self-referential and cyclic processes govern the verbal/textual flow.*

The steering function of the agents is achieved by an unambiguous identification of the textual agents and their dependency relations. This function produces twisting and twining. Twining marks an irreversible folding of the curve of Figure 5, where a new agent variable is introduced in the form of a layered composite.



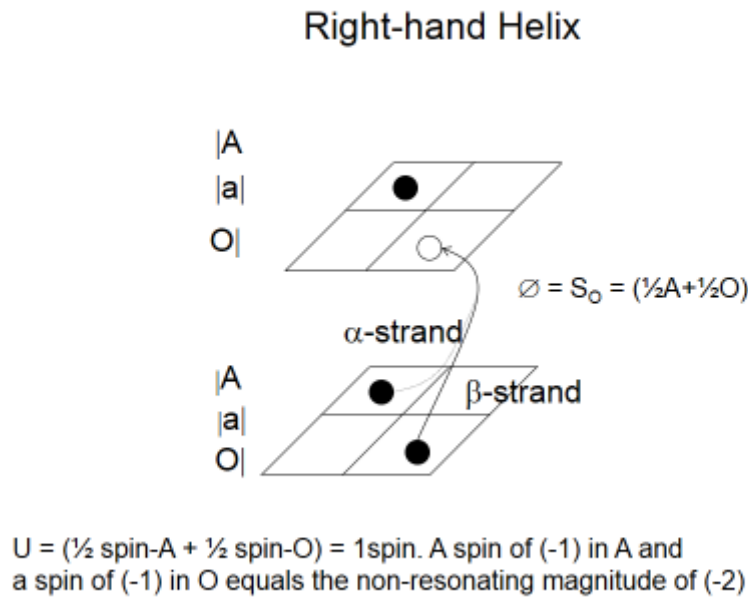
**Figure 5** *Irreversible text processing*

Figure 5 captures the phenomenon of intentionality underlying the texture of a text. Twisting of the helix around its own axis is instantiated by the existence of a material agent string or the formal indicator ( $\emptyset$ ) for marking the immaterial agent string. Visualising the flow and the linkage requires moving dots, whose function is to indicate the rotational translations and transformations in the formation of a structure. Once a displacement structure is formed, homogeneity of time and space is destroyed (Prigogine, 1980, p. 104).

### 2.2.2 Orientation

A complementary helix is formed by the orientation of the text producer and is consequently associated with his objectives. The process of transferring the objectives initiates a phase-dependent coupling. Unfolding this coupling shows how the biological expressions of a language system makes use of a *reversible synthesizing rotary motor* (Hernández, Kay & Leigh, 2004) that controls the displacement of the constitutive A's and O's.

Constraining and breaking constraints is portraying the structural co-operation of the A's and O's as subunits and prescribes the process of integrating the objectives based on the agent function. In the course of writing, the text producer continually contributes with new agent- objective couplings whose orientation is toward an increasing configuration order. Thus, the textual flow must contain soft moulded objectives. However, the process of writing and rewriting constrains the moulding ( $\emptyset$ ) function over the flow by patterning the flow itself. The relational order is signalled by another closed system functioning as pointers towards ecologically determined objectives and events. A small dictionary of pointers (the prepositions) relating objects and events are used in identifying the objectives of the produced text. The linguistic pointers to the objective operate according to the following handles:



**Figure 6** *Reversible text processing*

*Prep [absent]* – Implies those viewpoints carry the properties of viewing and envisioning. The viewpoints define the direction and form the conception or idea of a text.

*Prep [in, over, towards]* – Implies ‘standpoint’ which define the ground and are coupled to attractances, drawing or relating the viewpoints to reality. Standpoints carry the relational scope of an observation. However, content and meaning in a semantic sense are no adequate concepts in their functional analysis.

*Prep [with]* – Implies ‘Aid’ points, which are defined, based on the Latin verb *adiutare*, which means to help. ‘Means’ are most specific and not so frequent.

*Prep [for]* – Implies set points (or why not aim points which is less concrete) which define the ‘Goal’, something beyond the horizon. Intended ultimate behavioural outcomes are influenced by the intention of the text producer and the constraints of the environment.

### 2.2.3 Directiveness

Ecological information carried by the pointers cannot be studied without the relative fine surface structure providing for a wealth of transitions and overlaps. Directive activity has to be regarded as intentional.

**Proposition 7** *Different and intertwined trajectories reflect the intentional dynamics of the textual flow.*

Standard grammatical description associates intentionality with the verbs of a language. The verb function is associated with the structural aspect necessary for a forceful description of syntactic properties pertaining to co-ordinated clauses. Based on a dictionary of verb stems together with prefixes and suffixes the structural aspects pertaining to the mechanics of

language are identified. The variability of strings in a sequence implies that the units of the verb function should be treated as unit functions themselves (Ghiselin, 1981, p. 200).

**Proposition 8** *The nucleus function that the verb fulfils is to preserve the directiveness in the process of perspectivation.*

This proposition is the common basis for capturing the structure supporting a text. This basis should not be confused with the texture of the text itself. From the agent's point of view, it is unimportant to know what a particular word means, because perspectivation is different from consensually derived knowledge as reflected by some authority in the form of a person, text or institution. What counts for Kantian *reason for realism* is that words have the function of being medium between experience and cognition.

The central properties of the double helix (Figures 5 and 6) can now be summarised in the form of a reversible synthesizing AaO machine that makes it possible to discover structural information that is independent of the machine itself. With respect to the complementary role of its subunits, the following basic activities are carried out:

- (1) Governed by openers, an iterative procedure interchanges strings of graphemes.
- (2) Dummies ( $\emptyset_A$ ) for the agents and objectives ( $\emptyset_O$ ) are substituted with strings.
- (3) The dummies for the agents are processed by a forward or downward move.
- (4) The dummies for the objectives are processed by a backward or upward move.
- (5) Pendular down- and upward swings perform according to limit cycles.
- (6) The limit cycle mode controls the discontinuities and changes in the textual flow.
- (7) Clock-like cyclic and recursive procedures establish a dynamic regime.

A natural language system interacts through the properties of its components and exists in the operation space that these components specify. However, it is the flow of energy, governed by internal processes, that gives rise to its structure. The relational quantities to be presented in the following constitute a measure on a particular style. Physical principles fashion the translational states in the development of a style. Text building requires:

(1) A body composed of graphemes and spaces in and between strings of graphemes. These constitute the amount of graphemes identified in a language body. The quantities of visible elements and separating spaces make up the totality, which constitutes a unified body with no specific shape.

(2) The time interval between two successive occurrences of variables is called a natural period of the cycloidal arc. The full pause at the end of a spoken sentence or the sentence markers (. ! ?) at the end of any statement thought to be complete, are taken as indicators of unit time.

(3) When the variables of all three constitutive components of the AaO formula are identified and assigned the value of their functional clause, a Block (1, 2, 3, ..., n) becomes manifest. A block determines the unit of extension. A period is characterised by the establishment of one or more blocks. The number of counted blocks per period gives a quantitative measure of the rate at which kinetic energy produces a textual flow in a particular language system. In general terms, extent is operationalized with the length of a trajectory.

Due to their firm form, A-O couples remain unchanged when order parameters are determining the evolutionary course of these forms. It follows that the *Block* is manifesting inescapable regularity and consequently an important constraint concerning the way in which

time can enter into the process. By introducing the identified Blocks in the sequential order of the  $\alpha$ -strand, this strand is taking a lead in the development of a thermodynamic trajectory.

In focusing on the length of a certain interval of a thermodynamic trajectory, it is implied that time enters a second time. But now, time is organising the textual agents along their evolutionary path. Because of the directional orientation in this development, it is immediately clear that the process must lead to the double helix, originally pictured in B. Bierschenk (1991, 1993). However, independently of what form the helix is assuming during processing, generated order parameters and their breaking has a constraining effect, because they are concentrating only unique strings of graphemes as the valid strings of processing. It follows that validity has been defined according to the following stipulations:

- (1) A valid concentration of strings into a Block is produced when the strings of all subunits are identified.
- (2) A valid Block is established whenever the strict dependency relation between the A- and O-subunits has been observed.

In order to duplicate an AaO-unit, the mechanism is working independent of the meaning of a unit or subunit when it is replicating it into a particular (Aa(AaO))-sequence. Conceived thermodynamically, it implies that a topological singularity may be emerging. At a minimum, it means, whenever a moving variable meets another variable at some specific instant, a discontinuity in the nature of the evolving variable configuration can be expected.

### 3 Production of Abstract Spaces

The *science* comes in locating and making use of the discontinuity, and discovering which of the many alternative mechanisms underlie its particular character.

Winfree, 1980, p. 28

Since a scientific approach, in a most fundamental sense, begins with the observation of discontinuity in natural phenomena, the study of information synthesis at the language level must begin with the study of stability and loss. In this respect, the study of natural language systems is no exception. In order to keep track of a prescribed path and to recover the ideas underlying this path one by one without gaps and in perfect order, it is necessary to introduce the concept of a *super-string*. Therefore, a super-string may be conceived of as part of an *effective notation* (von Baeyer, 1999, p. 12).

Superstrings and the appearance of evolutionary changes in the *flat molecular formation* (Hardison, 1999, p. 126) of the AaO unit was detected in connection with the production of abstract language spaces. With reference to Hardison's exposé, the concept of a flat molecular formation is taken as a suitable notation for the primitive form of a molecular AaO unit. Hence, in its most primitive appearance, it will be equated with the emergence of an AaO-ring.

In function, the nature of an AaO-ring is definitely different compared to the conventional description of sets of point standing in definite relation to one another. Rather an AaO-ring is describing the intentional property of a set of variables, which reside in the ring. Thus, the notion ring can be separated from the notion area that consists as a set of points. It follows that intention is an indispensable component in the determination of distance between variables, neighbouring in a ring. Of course, during the development of rings, growing composites becomes embedded in the evolutionary path, governing text production.

### 3.1 Timing and Spacing

Now the idea is to consider the successful matching of a string of graphemes with the corresponding dictionary. Since the A- and the O-component is cutting through the **a**-component, the latter may be conceived of as the axis of the AaO. In an attempt to formulate the operations of dynamic text building and its juxtapositions as two or more immaterial variables, the dummies are used, which have been distinguished previously. Whenever the position before and after the **a**-component is empty, this measure allows for the representation of an AaO unit as a molar combination of two sub-units working with immaterial strings. As shown in Table 1, processing of a natural language remark must involve the successful matching of strings, controlled by the **a**-component, because it is controlling the presence or absence of a complete AaO unit.

**Table 1**

*Processing of an incomplete AaO unit*

String	Notation
$\emptyset_A$	Immaterial ( $\alpha$ )
<b>Is</b>	Formal ( <b>a</b> )
$\emptyset_O$	Immaterial ( $\beta$ )

This approach transforms the **a**-component into a constant that generates the rotational dynamics of a textual flow field. When a field is conceived of as  $[F(\alpha, \beta, t)]$ , it means that a vector-valued state function is operating on the field. The significance of this definition of a flow-field is founded on the hypothesis that distance is a function of rotational acceleration and that *spinors* (Hestenes, 1986/1993) have the capacity to carry and to represent the magnitudes of a rotation of two-dimensional  $\alpha\beta$ -sheets. Since Hestenes spinor mathematics provides a notation that postulates the concept of a *directional bivector*, it has the capacity to represent directed surface segments.

Hestenes (1986/1993, pp. 66-68) asserts that an angle ( $\theta$ ) is just twice the directed area of the circular sector between a vector ( $\alpha$ ) and another vector ( $\beta$ ). This relation is determined by the simple proportion of an *area of a sector*, when put in relation to its *arc length*. This proportion is equal to the *area of a circle*, when it is put in relation to its *circumference*. Hence, the expression of Table 1 must be evaluated with respect to the characteristics of the involved angular displacements.

Furthermore, in the case shown in Table 1, a counter-clockwise move through the entire field demonstrates that the displacement of an  $\alpha$ -variable and a  $\beta$ -variable in the direction of (**a**) has failed. Fails the displacement of the trivector  $[T^1 = (\alpha\wedge\beta)\wedge\mathbf{a}]$  in the direction of (**a**), sweeping out the four-dimensional space segment has likewise failed. This can be expressed by writing the outcome as expression  $[(\alpha\wedge\beta\wedge\mathbf{a})\wedge\mathbf{i} = (\alpha\wedge\beta\wedge\mathbf{a}\wedge\mathbf{i}) = 0]$ .

Since the displacement condition (i) is sweeping out the four-dimensional space segment, it can be concluded that the variable ( $\alpha$ ) of the A-component is inseparable from the variable ( $\beta$ ) of the O-component. Both are standing in perpendicular relation to each other and a possible distinction between direction and orientation cannot be made. When there is no return to any of the subunits the value of a cyclic move is set to zero.

### 3.2 Computation of Sense

Moreover, as was shown in Table 1, there is no positive match with the textual elements of the verb dictionary ( $\Omega$ ) that would produce a signal of *intent* (**i**) which is controlled by the stepping function (**i**). In automatic processing, it has been of great value to redefine the zero vectors of ( $\alpha$ ) and ( $\beta$ ) by introducing the dummies ( $\emptyset_A$ ) and ( $\emptyset_O$ )



respectively. It follows that the path of any angular displacement within an AaO unit is operationally principled through the spinors. Letting the involved mechanism update the impact by inserting (X) for the missing Agent-variable and (Y) for the missing Objective-variable, makes possible the equation: [X **is** Y]. In order to underline the formal character of the verb in the present condition it is treated as the sign of equality. This leads of course the propositional *no-sense* expression [X=Y]. Thus, in using the clocking mode in the determination of the degree of displacement, it is possible to demonstrate that a particular variable must have a direction and an orientation toward a unique place.

That a certain move must relate to a particular place requires that the processing is advancing one more step. By analysing the text of Table 2 as the outcome of the possible displacement of the textual elements ('The attitude is today') through the working of two independent but co-ordinated clocks, rhythmic and clock-like pendular movements as well as their unique geometric properties are emerging. This is equivalent with saying that the cyclic return is of ( $\kappa_i$ ) steps. Stepping is producing distinctive rotations of the involved strings. The essence of a specific change in angular articulation can be extracted from Table 2.

**Table 2**  
*Processing of a complete AaO unit*

<i>Rotation</i>	<i>String</i>	<i>Notation</i>
$\phi=180^\circ$	The attitude	Textual elements of an $\alpha$ -string
	<b>Is</b>	Textual element of a $\omega$ -string
$\theta=180^\circ$	Today	Textual element of a $\beta$ -string

The magnitude of a complete conceptualisation can obviously be equated with the concept of wholeness, which in geometrical terms amounts to ( $360^\circ$ ). A comprehensive profile over the rho ( $\rho$ ) dimensional shapes of a configuration of AaO units, where ( $\rho$ ) defines the relation: [ $\rho(e^{i\theta}) = U$ ], is crucial for understanding the dynamics of a configuration. Unity makes evident the hidden capacity of the involved superstrings, because these strings transform an AaO-configuration into seamless ( $\rho$ ) dimensional spaces which are negatively curved. By definition, these spaces are *hyperbolic at any level* (Connes, 1994) and the rotational processes are producing convoluted structures underlying information synthesis.

It follows that the convoluted structures of text production come into existence only with the production of a textual flow. Furthermore, a deviation from the surface-uniformity may be conceived of as establishment of a textured surface characterised by a prismatic texture. Thus, Table 3 shows that the angles of a complete verbal expression must take into account the spectral area of a texture rather than an arc length.

**Table 3**  
*Prismatic texture*

<i>Pattern</i>	<i>Property</i>	<i>Magnitude</i>
Messenger	Winding	Value 1/1
+ Word	Curling	Value 1/10
+ Grapheme	Valve	Value 1/100

Geometrically, the share in the prismatic textual surface is related to the resonating property of neighbouring grapheme sequences. To be complete, each cyclic move must return a value ( $\phi$  or  $\theta$ ), which gives expression to the rotation of a material or immaterial strings or composites of strings. This corresponds very naturally to the computation of different kinds of phase-dependencies and consequently the contrasting of *sense* with *non-sense*.

For example, when a marker of a period or a fraction of a period is involved, it means that any string addition is accounted for by that case plus its degree of rotation divided by ten. Passing from fractionally accessible strings to the processing of complete expressions, the computational rules state that any string addition should be accounted for by the addition of the case in question (B. Bierschenk, 2011, p. 16) plus that case divided by nine. The computational consequences have been shown in considerable detail (B. Bierschenk, 2011; I. Bierschenk & B. Bierschenk, 2011)

Hence, the reality of angular articulation resides not in the physical reality of a grapheme, but in the hypothetical fraction or *share*, related to a textual flow. It follows that *intention* must be mediated by an exchange of virtual properties by means of flow-fields. Since a flow-field itself is made up of strings that mediate all intentions, rotational displacement must take into account all deviations from uniformity in space and time. Stated in geometrical terms, the intrinsic property of a spinor makes possible the processes by which graphemes are integrated counter-clockwise.

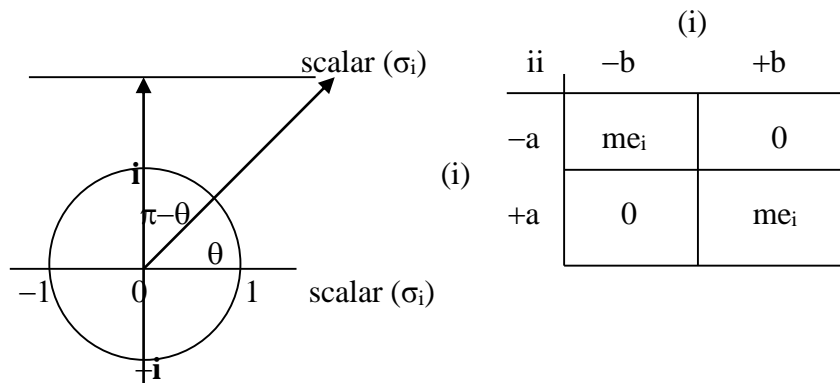
#### 4 The Interval-Sensitive Zipper

As was shown in the Figures 5 and 6, the course of development is captured by the degree of displacement. Hence, development is expressible as a sequential series of  $\alpha\beta$ -composites. However, a translation in which several edges are participating is cutting through the asymmetric point located in the annulus. Furthermore, when the individual strings of the  $\alpha$ -strand are treated as if they were mounted parallel to the strings of the  $\beta$ -strand, their relational order implies that they are running on equal distance.

##### 4.1 The Zipper Mechanism

Progressive processing of information on the distance between the actual state and the equilibrium state of the language system demands an operator valued function or a *q-number* as a measure of the existence of an *Identity* relation within a groupoid ( $G^*$ ). Convolutions of groupoids are producing the kind of order parameters that generate the dynamic aspects of pattern displacement. The ‘groupoid’ ( $G^*$ ) is replacing the ‘classical frequency group’ ( $G$ ).

In changing to the Zipper mechanism, groupoids play a crucial role in the foliation of the state of a system and the determination of its thermodynamic limit as shown in Figure 7.



**Figure 7** Symmetry-breaking foliation

The general tool of this kind of functional analysis is the spectral radius of any observation ( $\sigma$ ), given by  $[||\sigma|| = (\text{Spectral radius of } \sigma_i \bullet \sigma_i)^{1/2}]$  and the natural framework for this non-commutative geometric approach is the measurement in radians (Connes, 1994, pp. 3-7). Grouping based on degrees of changes in articulation is a particularly relevant illustration of

the difference between previously achieved results with commutative measures on one-hand and noncommutative measures on the other (Mackenzie, 1997).

This approach has the mathematical convenience of providing a rational zero, namely the dissimilarity of two identical strings (ii) of graphemes. However, local conditions may operate on individual patterns of strings making spacing different from timing. Folding the surface features into groupings means that natural groups are identified, whose content is easily scrutinised by the process of assigning a meaningful name to the identified groups.

A simple numerical procedure for calculating symmetry-breaking behaviour is based on the design of the two-by-two table of Figure 8.

		(B)	
(A)	1	0	$\omega = \frac{1}{2}[(a_2b_1 + a_2b_2) - \frac{1}{2}(a_1b_1 + a_1b_2)]$ $\frac{1}{2}[(0 + 1) - \frac{1}{2}(1 + 0)]$ $\omega = 0.00$
	0	1	

$\omega$  = Change in the presence of sense or information

**Figure 8** *The Z-operator*

Simple numerical calculation makes evident that the operator generates identical main and interaction effects. At the first step of calculation, the Zipper (Z) algorithm defines the informational interaction of two kinds of virtual processes at two line segments ( $a \neq b$ ), which is half the difference between the effects of carrying versus non-carrying of a physical quantity. Formally expressed, the procedure is working with  $[\omega = \frac{1}{2}(a_2b_2 + a_1b_1) - \frac{1}{2}(a_1b_2 + a_2b_1)]$  and producing smooth groupoids ( $G^*$ ), which correspond to the discovery of the progressive information in the leaves of a foliation. Based on the subtle speed in the clocking mode of articulation Figure (9) below gives an illustration of the working of the Z-operator.

**Proposition 9** *All binary groups have to be presented as contiguous to the asymmetrical and transitive nature of the order relation of the states.*

Applying the Zipper mechanism means applying a technical operation to the fusion algorithm, which is carried out according to the following rules:

#### *General*

1. In the selection of a value, sequential priority is determined globally.
2. Neighbourhood has priority and is determined locally.
3. The values have to be compared in pairs and within each single interval.
4. Each and every interval is demarcated through punctuation.
4. The mean-difference has to be computed for every pair in a given interval.
5. Connected groups of values have to be arranged into a network.

#### *First Run*

1. Find the pair with the mean difference.
2. Do not surpass the criterion ( $w=1.00$ ).
3. Fuse the pair with its neighbour first.
4. Follow the sequential order of the textual flow.
5. Search for all other mean differences below the criterion.
6. Fuse within the given interval.

<i>Closing Operation</i> <i>Step1</i>	<i>Criterion</i> <i>(0&gt;ω&lt;1)</i>	<i>Folding</i> <i>Step2</i>	<i>Fold of Folding</i> <i>Step 3</i>									
<table><tr><td>0</td><td>0</td></tr><tr><td>0</td><td>0.40</td></tr></table>	0	0	0	0.40	$0.40/2$ $= 0.20$	<table><tr><td>0.40</td><td>0</td></tr><tr><td>0</td><td>3.21</td></tr></table>	0.40	0	0	3.21	$2.81/2$ $= 1.41$	
0	0											
0	0.40											
0.40	0											
0	3.21											
<table><tr><td>0</td><td>0</td></tr><tr><td>0</td><td>3.21</td></tr></table>	0	0	0	3.21	$3.21/2$ $= 1.61$		<table><tr><td>0.40</td><td>0</td></tr><tr><td>0</td><td>3.68</td></tr></table>	0.40	0	0	3.68	$3.28/2$ $= 1.64$
0	0											
0	3.21											
0.40	0											
0	3.68											
<table><tr><td>0</td><td>0</td></tr><tr><td>0</td><td>4.14</td></tr></table>	0	0	0	4.14	$4.14/2$ $= 2.07$	<table><tr><td>3.21</td><td>0</td></tr><tr><td>0</td><td>4.14</td></tr></table>	3.21	0	0	4.14	$0.93/2$ $= 0.47$	
0	0											
0	4.14											
3.21	0											
0	4.14											

**Figure 9** Iteration of *C*-matrices in the folding process of a  $\beta$ -strand

#### *Second Run*

1. Compute the mean value of the formed pairs within a certain interval.
2. Compare the mean values of the formed pairs within the given interval.
3. Fuse the pairs within close neighbourhood in the given interval.
4. Compute the mean difference between formed pairs as well as pairs of ( $\emptyset$ +single value).
5. Fuse all pairs with due consideration of local closeness.

#### *Third Run*

1. Transit adjacent punctuation borders within a given period in order to form new pairs.
2. Compare the new pairs with already existing pairs.
3. Continue with the pair-wise comparison within the single periods before transiting.

#### *Further Runs*

1. Transit the border of a single period when no more fusion over intervals is possible.
2. Continue over the border of adjacent periods and connected backward.

A manual application of the instructions has been concentrated on the fusion and transformation. Fusion and the examination of the resulting trees show that the tree-structures can be determined mechanically and on purely empirical grounds. Since the same criterion value can be applied to the zipping repeated times, the result of different analyses becomes meaningful from a theoretical point of view. Within the presented context, it can be argued that the information in a text determines the condition, which allows for the establishment of trees. More important is that the structured configurations of themes and motifs can be observed.

As a result, folding mono-layered and multi-layered composites, based on a fusion algorithm, has empirical value, because it regards a configuration of composites as relations, which are mutually dependent. To catch the fundamental implications of information synthesis requires that the underlying order variables are producing ecologically valid spaces.

Thus, the common causal determination of the folds in the produced concentration spaces can be processed as the functional definition of fitness. The concept implies a new kind of conservation, which is approached experimentally. Based on the kinetic trajectories of the underlying sequencing spaces, at present, the aim concerns the establishment of binary tree-structures at the kinematic level.

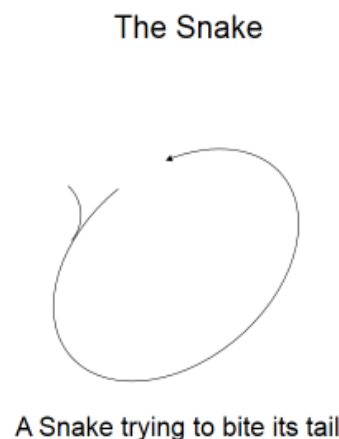
#### 4.2 Working on the $\beta$ -Strand

Sequential order in timing commands that the value of the second groupoid is joining the value of the first. Forming a new groupoid out of the first two initiates the third step and consequently a new iteration. This time a pair is formed that consist of two group means. Obviously, something happens every time a new pair is formed. However, nothing remarkable seems to have happened in its neighbourhood. The deviation meets the criterion value for binding. Sufficiently small deviations warrant binding to an already formed group. It is therefore only natural to say that the process at each point of observation is changing its appearance in continuous or discontinuous manner.

**Proposition 10** *The break points for merging and branching are characterised by time-dependent and periodic oscillatory processes.*

Every time when a bifurcation can be observed, it points towards some more or less significant discontinuity in the argumentation. It can be said that continuous changes in the independent parameters evoke these discontinuities. If the instantiated changes are small, they will produce a *homorhetic* path. Any time the transition from one state to another produce a sudden, unexpected or exceptional jump a new path comes into existence resulting in a *hysteresis*. The physical process of text building causing this kind of jump mediates informational invariants that, in a sense, are fundamentally different from the informational invariants described by the path before a hysteresis occurs.

In recognising the complexity of dependency relations in the three-dimensional architecture of the helical configuration, a discussion of textual transformations becomes meaningful first through an approach that approximates the relationship among various parts of text as a unity in a plot, symbolising *a snake trying to bite its tail*.



**Figure 10** *The snake trying to bite its tail*

By maintaining topographical coherence between intention and orientation and its representation in the text, the nature of the transformed information stored in the snake's path changes as the snake progresses from one state to the next. Thus, the unity of a text becomes *self-indicative*.

**Proposition 11** *The auto-oscillatory working of the head of the Snake represents self-indication by 'cognitive' locomotion or displacements.*

The spiral line followed by the Snake on its path is a transitory and configurationally formed pattern of the line of *growth*. This line represents the lasting record of successive states of magnitude and *form* (Thompson, 1942). The growing path can be likened with a continuous forward-looking displacement of the Snake's head.

### 4.3 Capturing the Snake with a Mesh

It is only within the *Cartesian Mesh System* where the quantities of text building remain constant. Caused by the influence of intention and orientation, the Snake's head is rhythmically and pendular raised and lowered as indicated by the emergence of new *point attractants*. In manifesting the effects of the kinetic potential on the patterning of textual strings, two parallel working timing mechanisms have been observed. Both are dependent on two kinds of time, which allow for the evolution of the kinematic trajectories. In the first case, timing of the kinetic processes determines the transformation of a potential into a textual flow. In the second case, timing concerns irreversible thermodynamic flow processes. Periodic work-cycles of the operating process become terminated, whenever a steady state comes into existence. Any time a new phase is initiated, the mechanical processes become reactivated through cyclic returns.

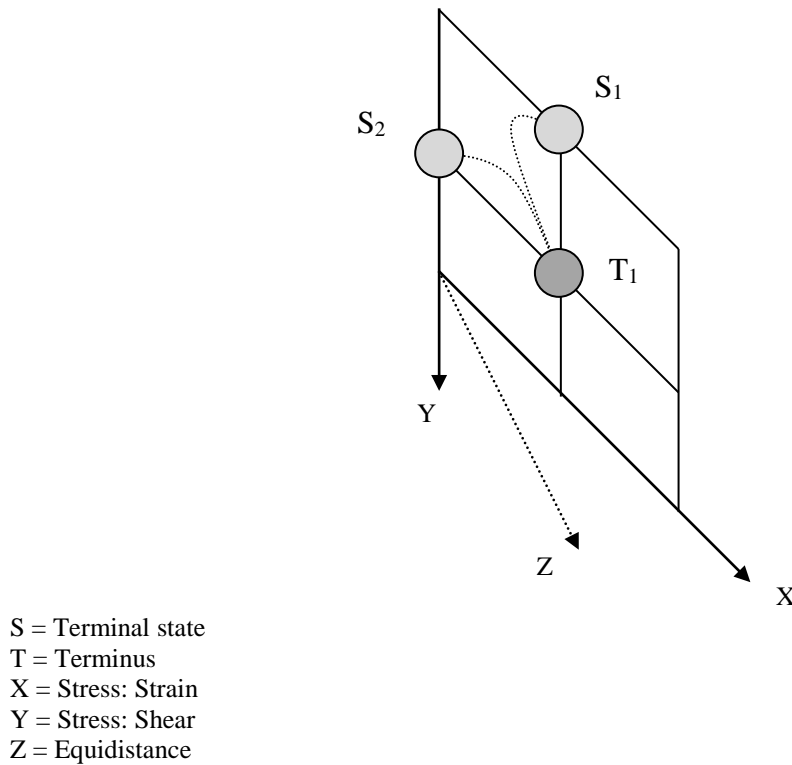
An elementary application of a *minimally sufficient mesh* may be done with the purpose of comparing the dimensionality of the '*behaviour space*' of one Snake with that of another one. Thereby, self-indication can be made the basis for a formalisation of *self-reference*. Moreover, because the Snake is an indivisible unity, its completeness gives expression to *the production of consciousness as the manifestation conservational invariance*.

## 5 The Behaviour Space

From a topological point of view, it can be stated that the *point attractors* at ( $S_1$ ) and ( $S_2$ ) mark the terminal states while ( $T_1$ ) indicates a stable *state attractor*. If it shall be possible to orient oneself in this state space, it must be conceivable to transit its terminal states and to manifest the results in the form of a transformation path like the one shown in Figure 11. Thus, the transition through a terminal state is strictly controlled by the underlying dependency relations. Since this transformation exists only over time it is generating the termini of the state attractors and is correcting itself.

**Proposition 12** *Topological invariance manifests itself in the points where bifurcation arise or where two trajectories cross each other.*

Furthermore, repeated transformations and crossing of one path with another allows for the integration of the consequences of having found the function in the form of structural relations. Thus, shifting experiences are provided during specification, which is expected to lead to an understanding of the meaning of the transformation function. It follows that this operation must become recognisable in the form of termini.



**Figure 11** *The grid-layout*

Since a terminus is the result of a transformation process, it incorporates both the “state” as well as the “dependency relation” between termini.

**Proposition 13** *Singularities are to be characterised by a configuration of termini.*

In correspondence with this proposition, it can be argued that the thermodynamic factor driving the textual flow towards global stability defines the behaviour space of the system. If this space determines global stability it must be that, the kinetic processes exhibit some instability (Prigogine, 1980, p. 103; Kugler & Turvey, 1987, p. 53). Through the interplay between inward and outward looking stabilities, phase transitions can be observed. It sets the ground for an irreversible flow from the initial to the final state. The variables required for describing the non-equilibrium states are as a rule larger than the number of equilibrium states.

**Proposition 14** *A decision on the minimally sufficient number of states implies a decision on the number of variables describing the states of the system.*

By relating a final state to an initial state evolving in the neighbourhood of each other, the needed transport processes are produced. These give rise to a course containing the states of attraction. Any singularity on the path marks a macroscopic and thus, a qualitatively distinct mode of organisation.

Thus, the aim with the folding procedures is to explain the attractors of the Free Energy Surfaces (FES). In the beginning, an FES consists of nothing but topological patterns

under transformation, i.e. the abstract configuration of attractors. A detailed description of the transformational steps involved in a sequence of attractors allows for a thoroughly controlled specifying process. Terminologically controlled state-changes are expected to lead to an exact and precise communication of ecologically significant information invariants. For this process to be comprehensible, it is worthwhile to follow up the process of generating termini by going back to the text surface (see I. Bierschenk & B. Bierschenk, 2011, p. 4) because that is the place where the structure of the text is anchored.

### 5.1 The Naming Process

To get some feeling for the way in which the recommended procedure works, Table 4 may be taken as an example of the result to be expected from the transformation process.

**Table 4**

*Transformation of  $\beta_4$  through  $\beta_6$  to  $T_1$*

State	Variable	Value	String
Terminal State ( $S_3$ )	$\beta_4$	3.9564	I
Terminal State ( $S_4$ )	$\beta_6$	4.4274	my salary
Terminus ( $T_2$ )		8.3838	Security

Transformation on the  $\beta$ -strand begins with binding its strings to the respective point attractor (i.e., the edge value of the underlying mesh). This is the first step in the process. As illustrated, the variable ( $\beta_4$ ) connects to the grapheme string ('I'). According to the mesh representation, the curved line from the variable to the singularity ( $T_2$ ) is indicating that this string should be transformed to something else, which however no longer has any physical existence. For this reason, the second curved line must be taken into account. It orients towards ( $T_2$ ). Since it connects variable ( $\beta_6$ ) you need to get hold of the associated textual string, namely 'my salary'.

If the latter shall have any influence on the former it must result in something transformed (i.e., something new). Preliminary, the naming process is settling on 'Security' as the best approximation. Of course, one may feel free to find an alternative description, which can catch the strength of this transforming step. In any case, the result should be virtual, i.e. have no longer any direct correspondence with the physical context.

Presumably, it will become obvious that there is an inbuilt and dynamic correction mechanism. If one end up too far away from a suitable terminus, the naming process will not come up with a conclusive terminus and the ring will not form properly.

**Proposition 15** *If a structured configuration can be observed and named or if a name exists which points towards a structure this implies that an articulated nonlinear topological constituent can be extracted.*

### 5.2 Coupling the A- with the O-grid

In order to obtain a depth relation it is necessary to treat the  $\alpha$ - and  $\beta$ -variables as autonomous units. A logical consequence of this measure is manifesting itself in cyclic overlapping. Evidently, differences in timing are producing difference in velocity of movement. These differences are responsible for the presence or absence of thermodynamic curves characterising holo-topic configurations.

Coupling differently running trajectories is a reworking that generates information of a higher degree of abstraction. Detailed information on the procedure of Table 5 may be found in I. Bierschenk and B. Bierschenk (2011, pp. 28-30). The description of the nodes of the A-



mesh requires the extraction of proper termini. By looking for the starting variable, which is a dummy (D) and by following the path to ( $\alpha_1$ ) the name for the singularity ( $T_{A1}$ ) can be extracted. The necessary instrument is a coupling matrix of the kind illustrated in Table 5.

**Table 5**

*Extraction of termini from the O-grid*

<i>A-grid</i>	<i>O-grid</i>		
<i>Pendulum</i>	<i>Destination</i>	<i>Extraction</i>	<i>Value</i>
$T_{A1}: D \rightarrow \alpha_1$	$T_{O16}$	Inclination	3.5796
$T_{A2}: D \rightarrow \alpha_2$	$T_{O1}$	Denial	7.141487
$T_{A3}: \alpha_4 \rightarrow \alpha_5$	$T_{O13}$	Mood	7.582192
$T_{A4}: T_{A3} \rightarrow T_{A2}$	$T_{O2}$	Security	13.280192
$T_{A5}: T_{A4} \rightarrow T_{A1}$	$T_{O3}$	Self-sufficiency	16.859792

To find the corresponding path in the O-mesh requires a switch to ( $\beta_1$ ) and to follow the path to (D). Immediately before the (D), the terminus for the description ( $T_{O16}$ ) is found. This is the terminus ‘Inclination’. Thus, ( $T_{A1}$ ) gets this term as its descriptor. In continuing the transitions means approaching (D) and a transition to ( $\alpha_2$ ), which is the needed groupoid. Hence, the other guides the process towards ( $T_{A2}$ ). In switching to the O-mesh and in following the path of the corresponding ( $\beta_2$ ) to (D), the position can be determined where the proper description for ( $T_{A2}$ ) can be extracted. Just before this terminal (D), the process finds ( $T_{O1}$ ) and is thereby extracting its terminus, which is ‘Denial’, as proper description of ( $T_{A1}$ ).

In summing up, when length is connected no longer arc wise, an abstract space of very many dimensions becomes available, which develops on two simple matrices, however, differing in the embodiment of copies (C). Hence, the Z-mechanism is working with the operator ( $Z=C \otimes C$ ), which is the direct result of connecting two discrete points ( $a \neq b$ ). It follows that the established distance ( $\Delta$ ) operator is based on the natural  $\kappa$ -cycle, which is given by the diagonal action of (Z). The ( $\Delta$ ) operator of the folding Z-matrix makes the coupling process manifest and gives the folding its direct physical meaning. Hence, emerging is a double space-time account. It consists of the ordinary space-time product, manipulated by a very tiny discrete two-point space.

## 6. Perspective Transformation

It is characteristic of the evolved terminal states that the dynamic formalism of the PTA system has created co-operation and interaction between various sub-systems. This mode has to be contrasted with the commonly favoured elemental units of action and their organisation into stable hierarchies. The result is a course of action, which differentiates out various terminal states from the set of data of which the states are part. The way in which these states are linked to each other may be different from one analysed system to the other. Each gives rise to a course, which determines the dynamics of the original text.

This is so, because, as a person, the originator of a text has incorporated his perspective in his writing. This intentionality governs the dynamics of the process and patterns the contextual constraints, which various states enforce on his text building behaviour. With this orientation, Perspective Text Analysis has overcome the all too concrete way of viewing perception and conception of text as simple pattern generation and recognition. This abstraction twines together ego-motion with the segregated terminal states. However, detecting motion is from the Gibsonian point of view not very useful. To act intentionally, one needs to know what has moved or changed.

The Agent-action-Objective (AaO) dependency in the formalism stipulates that the co-operation between the A's and the O's has to create a particular mode of resource use, namely, the pendular clocking (limit cycle) mode (Winfree, 1980), which forms the perspective on the objectives of a particular text. As a result, the patterns of rhythmic movements, expressed through asymmetrical relations between the (view-, stand-, aid-, and set-) points of the text and the textual agents, generates the binary agent groups. These groupings display a seemingly paradoxical situation as Kugler and Turvey (1987) observed, namely:

Traditionally it is held that if intentional contents are identical with physical states (say, states of the nervous system) then it cannot be the case that intentional content are sustained by physical states or vice versa. The argument is that two things or two state X and Y cannot be both identical and causally correlated (Smart, 1959). But given the equation of intentional content and nonholonomic constraints, there is no irregularity in the claim that intentional content can be realised in (read: identical with) and produced by (read: causally correlated with) physical processes (those of the nervous system) *provided that the realisation and production are phenomenon at different descriptive levels.* (pp. 416-417)

In correspondence with this view, it can be said that the intentional content of the binary agent groups is both identical with and caused by the agents of the binary groups, i.e., it is self-indicative and represented by the movements of the Snake. But in this paradox lies the orthodox. The unambiguous relation between certain groups realises (is identical with) a textual state and is sustained by this state. Being identical and produced by itself leads to the holotopic description of a certain agent group with the name of the causally dependent groups of agents. By employing the specific pendular clocking mode of text as a system, perspective invariants can be extracted.

It may be worthwhile to mention that Sperry (1952) has already discussed the untenable thesis of connectivity as foundation of an architecture of neural nets and as basis of consciousness. He also dismisses the neurophysiological view to conceive the brain processes as a result of a theoretical and generalised concept of a *machine* that works with a *brain code* as emphasised by Grossberg (1980) and Cook (1986), for example. He has accentuated interactionism with the purpose of overcoming the dominating identity theories of mind and matter. Sperry (1969) writes:

Most investigators of central functions will violently resist any suggestion that the causal sequence of electro-physico-chemical events in the brain, /.../ could in any way be influenced by conscious or mental forces. (p. 532)

Despite the fact that the connectivity principle (S-R connections) as well as the brain code postulate have been questioned, Simon (1981, p. 72) states that sensory input becomes organised on the basis of mathematical-logical propositions and that knowledge exists only and exclusively through what can be given propositional (p(X)) expression. Thus, consciousness is equated with representation and one-way causality between particular centra in a hierarchically organised nervous system. These theories propose the existence of some accumulated reaction-specific energy in the organism. Moreover, it is postulated that a relation between internal inhibitory mechanisms and behavioural outcome exists. But Hebb (1961) observed:

In the learning process, we do not have a one-to-one relation between progressive changes of behaviour and changes in the synapse". /.../ Whether a given synaptic junction will be activated in such regions of divergent conduction cannot be determined by control of the stimulating environment, the experimental situation in which the learning is to be established. (pp. 37-51)

The theories of information processing and interactionism, built on the concepts such as *energy, storing and flow* as if they were well anchored in theory and generally understood. In the theories based on energy models they are made use of as self-evident detonators' of operations whether machine or organism specific.

In contrast, the results presented in the present monograph make a distinction between the conceptual and phenomenological dimensions of information processing. The outcome is a different conception of information in that; it is founded on the Schema axiom, which gave rise to the Gibsonian formulation of information, which is specificational. Specification has been achieved through topological abstractions and topographical representations.

In returning to the third proposition, it can be concluded that the topological invariants (singularities) of a textual flow seem to function as the constraints (virtually and contextually) of text building behaviour. The established singularities make up the limits of the thermodynamic processes. This means that the macroscopic process determines the morphogenesis of text and that a study of its local and global stabilities allows for a reconstruction of the dynamics that generates it. Perspective Text Analysis puts its stress on the morphogenesis of the conceptualizing process that is on the 'discontinuities' in the phenomenon 'text'. This gives the opportunity to study the individual text producer's successive transformations and the straining and shearing of conceptual limits. They are the fundamental terms, and by definition, they are encompassed in the transformational changes.

Identification of a structure means that straining and shearing cannot be extended limitless. The growing of a structure is to be conceived of as a preservation and implies a constraint on the dynamics both mentally and contextually. Once the structure has been determined and named, the growth itself is named. Finding the structural and remoulding transformational invariants is to be equated with discovering a person's *consciousness* underlying the respective language system. Finally, since the discovered structures can be named, the names make consciousness communicable.

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